

Penn Cambria Curriculum

Course Name	Pre-Algebra 8
Length of Course	1 year (one period per day)
Grade Level	8
Prerequisites	None
Course Description	Pre-Algebra 8 is designed to provide students with a solid mathematical foundation which will enable them to succeed in Algebra and demonstration proficiency with grade 8 math standards.
Units of Study	Place Value and Rounding Algebra Tool Box Coordinates Using Calculators to Simplify Measurement Perimeter, Area, Volume and SA Geometry Percents and Statistics Real Life Percents and Proportions Algebraic Equations
Materials	Text: Holt <u>Pre-Algebra</u> 2004 Supplemental Materials: Teacher created materials, Assessment anchor content materials

Unit 1: Place Value Rounding

Estimated Time: 1 week

Standard Alignment:

- 2.1.8. A – Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).
- 2.1.8. B – Simplify numerical expressions involving exponents, scientific notation and using order of operations.
- 2.1.8. C – Distinguish between and order rational and irrational numbers.
- 2.1.8. F – Use the number line model to demonstrate integers and their applications.
- 2.2.8. E – Determine the appropriateness of overestimating in computation.
- 2.2.8. F – Identify the difference between exact value and approximation and determine which is appropriate for a given situation
- 2.4.8. B – Combine numeric relationships to arrive at a conclusion.
- 2.4.8. C – Use if... then statements to construct simple, valid arguments.
- 2.4.8. D – Construct, use and explain algorithmic procedures for computing and estimating with whole numbers, fractions, decimals and integers.

Curricular Objectives:**Students will:**

- A. Place Value
 - a. Locate decimals and commas
 - b. Read, write and spell numbers
 - c. Ordering decimals & whole numbers ($<$, $>$, $=$)
 - d. Insert commas
 - e. Write numbers in standard form
 - f. Find place value
- B. Rounding
 - a. Demonstrate ability to know when to round & when not to round
- C. Estimation
 - a. Discuss difference of estimating/guessing
 - b. Estimate sums, products, and differences

Assessments/ Measurement of Objectives:

- Chapter test on place value
- Class and homework practice activities

Suggested Methods of Instruction / Learning Activities:

- Interactive questions on telling place value and comparing numbers
- Matching worksheet on place value
- Index card review game
- Question and answer session
- Active notes participation
- Place value worksheet
- Rounding worksheet
- Rounding crossword puzzle (large group)

Unit 2: Algebra Tool Box

Estimated Time: 6-8 weeks

Standard Alignment:

- 2.1.8. A – Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).
- 2.1.8. B – Simplify numerical expressions involving exponents, scientific notation and using order of operations.
- 2.1.8. E – Simplify and expand algebraic expressions using exponential forms.
- 2.1.8. G – Use the inverse relationships between addition, subtraction, multiplication, division, exponentiation and root extraction to determine unknown quantities in equations.
- 2.2.8. A – Complete calculations by applying the order of operations.
- 2.2.8. B – Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions.
- 2.8.8. C – Create and interpret expressions, equations or inequalities that model problem situations.
- 2.8.8. E – Select and use a strategy to solve an equation or inequality, explain the solution and check the solution for accuracy.

Curricular Objectives:

Students will:

- A. Add, Subtract, Multiply, and Divide
 - a. Apply rules to signed numbers
 - b. Explain the concept of adding the opposite when subtract
- B. Order of Operations review
 - a. Demonstrate ability to use correct order of operations (PEMDAS)
 - b. Practice simplifying techniques
 - c. Use calculators to check answers
- C. Variables and Expressions
 - a. Explain the need for a variable
 - b. Demonstrate substitution
- D. Key Phrases and Translation
 - a. Identify words that mean to +, -, *, /
 - b. Translate words into expressions
- E. Addition and Subtraction Equations
 - a. Discuss and explain inverse operations related to addition/subtraction
 - b. Demonstrate understanding of when to add or subtract
- F. Multiplication and Division Equations
 - a. Discuss and explain inverse operations related to multiplication/division
 - b. Demonstrate understanding of when to multiply or divide
- G. 2-step Equations
 - a. Demonstrate the use of PEMDAS backwards for two-step equations
- H. Distributive Property
 - a. Know when to distribute and when not to
 - b. Identify equivalent expressions
- I. Combining Like Terms
 - a. Identify like terms using pictures
 - b. Know when to combine
 - c. Know how to combine
 - d. Demonstrate the ability to group like terms together and add
 - e. Use the distributive property and like terms
 - f. Add the opposite to combine terms

- g. Identify difference between unlike and like
- h. Simplify expressions

Assessments/ Measurement of Objectives:

- Equation quizzes
- Chapter test on Algebra concepts
- Class and homework practice activities

Suggested Methods of Instruction / Learning Activities:

- Stapling papers activity
- Question and answer session
- Active notes participation
- Blackboard practice
- White board practice (individual)
- Equation worksheets
- Active notes participation
- Positive/negative signed # worksheet
- Puzzle WS on combining like terms
- Solving equations WS
- Study guide

Unit 3: Coordinates

Estimated Time: 2 weeks

Standard Alignment:

- 2.1.8. A – Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).
- 2.1.8. B – Simplify numerical expressions involving exponents, scientific notation and using order of operations.
- 2.2.8. A – Complete calculations by applying the order of operations.
- 2.2.8. B – Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions.
- 2.8.8. A – Apply simple algebraic patterns to basic number theory and to spatial relations.
- 2.8.8. B – Discover, describe and generalize patterns, including linear, exponential and simple quadratic relationships.
- 2.8.8. C – Create and interpret expressions, equations or inequalities that model problem situations.
- 2.8.8. E – Select and use a strategy to solve an equation or inequality, explain the solution and check the solution for accuracy.
- 2.8.8. G – Represent relationships with tables or graphs in the coordinate plane and verbal or symbolic rules.
- 2.8.8. H – Graph a linear function from a rule or table.
- 2.8.8. J – Show that an equality relationship between two quantities remains the same as long as the same change is made in both quantities; explain how a change in one quantity determines another quantity in a functional relationship.
- 2.9.8. D – Identify, name, draw and list all properties of squares, cubes, pyramids, parallelograms, quadrilaterals, trapezoids, polygons, rectangles, rhombi, circles, spheres, triangles, prisms and cylinders.
- 2.11.8.C – Continue a pattern of numbers or objects that could be extended infinitely.

Curricular Objectives:

Students will:

- A. Intro to Coordinate Plane
 - a. Plot and label points
 - b. Define vocabulary related to coordinate plane
- B. Testing Solutions
 - a. Determine whether a point is a solution
 - b. Complete tables of values for an equation
- C. Graphing Using T-Charts
 - a. Create an x - y table to graph an equation
 - b. Discuss the difference between graphs
 - c. Graph a horizontal line
 - d. Graph a vertical line
- D. Polygons in Coordinate Plane
 - a. Complete a partially complete polygon
 - b. Use techniques to find the missing vertex
- E. Graph, Equation, and Table Matching
 - a. Match a table to an equation and vice versa
 - b. Match a graph to an equation and vice versa
 - c. Match a table to a graph and vice versa
 - d. Apply strategies to match eqns, graphs, etc
- F. Algebraic Patterns
 - a. Find missing number(s) in a pattern
 - b. Explain ways to complete the pattern
- G. Testing Solutions

- a. Determine whether a point is a solution
 - b. Complete tables of values for an equation
- H. Graphing Using T-Chart
 - a. Create an x - y table to graph an equation
 - b. Identify the difference between graphs
- I. Table and Equation Matching
 - a. Match a table to an equation and vice versa

Assessments/ Measurement of Objectives:

- Open-ended quizzes
- Chapter test on coordinates
- Class and homework practice activities

Suggested Methods of Instruction / Learning Activities:

- Question and answer session
- Active notes participation
- Testing solutions worksheet
- Graphing lines activity
- Open-ended large group practice
- Puzzle plotting worksheets
- Graph board active participation
- Study guide

Unit 4: Using Calculators to Simplify

Estimated Time: 1 – 2 days

Standard Alignment:

2.1.8 B Simplify numerical expressions involving exponents, scientific notation and using order of operations

Curricular Objectives:

Students will:

- A. Basic Calculator Operations
 - a. Use add, subtract, multiply, and divide
 - b. Go over clearing memory
 - c. Go over delete, clearing, and equals
 - d. Explain how to use parentheses
- B. Using Exponents and Square Roots
 - a. Use the ^ key to enter a power
 - b. Use the square root key to find square roots
- C. Entering Fractions into the Calculator
 - a. Use the numerator and denominator keys
 - b. Use the unit key
- D. Simplifying Fractions and Reducing
 - a. Use “Simp” and then “=”
 - b. Show how to simplify more than one time
- E. Mixed Calculator Review
 - a. General review mixing up lessons

Assessments/ Measurement of Objectives:

- Fractions calculator test
- Class activities / homework

Suggested Methods of Instruction / Learning Activities:

- Question/answer session
- Worksheets involving calculator practice
- Test on calculator functions/operations
- Fractions worksheet
- Student will explain processes
- Calculator practice worksheets

Unit 5: Measurement

Estimated Time: 2 weeks

Standard Alignment:

- 2.1.8. A – Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).
- 2.1.8. B – Simplify numerical expressions involving exponents, scientific notation and using order of operations.
- 2.2.8. B – Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions.
- 2.2.8. F – Identify the difference between exact value and approximation and determine which is appropriate for a given situation
- 2.3.8. A – Develop formulas and procedures for determining measurements (e.g., area, volume, distance).
- 2.4.8. F – Use measurements and statistics to quantify issues (e.g., in family, consumer science situations).

Curricular Objectives:

Students will:

- A. Metric Conversions
 - a. Identify prefixes used in metric units (“King Henry Died By Drinking Chocolate Milk”)
 - b. Move decimals to convert metric units
 - c. Identify when you might want to convert
- B. Customary Conversions
 - a. Use a table to convert customary measures
 - b. Use a fence to show the conversions
- C. Temperature Conversions
 - a. Use the temperature equations to convert

Assessments/ Measurement of Objectives:

- Test on conversions
- Class activities / homework

Suggested Methods of Instruction / Learning Activities:

- Conversion worksheets
- Open-ended conversion problems
- Temperature puzzle

Unit 6: Perimeter, Area, Volume & SA

Estimated Time: 4-6 weeks

Standard Alignment:

- 2.1.8. A – Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).
- 2.1.8. B – Simplify numerical expressions involving exponents, scientific notation and using order of operations.
- 2.1.8. D – Apply ratio and proportion to mathematical problem situations involving distance, rate, time and similar triangles.
- 2.1.8. E – Simplify and expand algebraic expressions using exponential forms.
- 2.1.8. F – Use the number line model to demonstrate integers and their applications.
- 2.1.8. G – Use the inverse relationships between addition, subtraction, multiplication, division, exponentiation and root extraction to determine unknown quantities in equations.
- 2.2.8. A – Complete calculations by applying the order of operations.
- 2.2.8. B – Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions.
- 2.2.8. C – Estimate the value of irrational numbers.
- 2.2.8. E – Determine the appropriateness of overestimating or underestimating in computation.
- 2.2.8. F – Identify the difference between exact value and approximation and determine which is appropriate for a given situation.
- 2.3.8. A – Develop formulas and procedures for determining measurements (e.g., area, volume, distance).
- 2.3.8. B – Solve rate problems (e.g., rate x time = distance, principal X interest rate = interest).
- 2.3.8. D – Estimate, use and describe measures of distance, rate, perimeter, area, volume, weight, mass and angles.
- 2.3.8. E – Describe how a change in linear dimension of an object affects its perimeter, area and volume.
- 2.4.8. B – Combine numeric relationships to arrive at a conclusion.
- 2.4.8. C – Use if... then statements to construct simple, valid arguments.
- 2.4.8. D – Construct, use and explain algorithmic procedures for computing and estimating with whole numbers, fractions, decimals and integers.
- 2.4.8. E – Distinguish between inductive and deductive reasoning.
- 2.5.8. A – Invent, select, use and justify the appropriate methods, materials and strategies to solve problems.
- 2.5.8. B – Verify and interpret results using precise mathematical language, notation and representations, including numerical tables and equations, simple algebraic equations and formulas, charts, graphs and diagrams.
- 2.5.8. C – Justify strategies and defend approaches used and conclusions reached.
- 2.5.8. D – Determine pertinent information in problem situations and whether any further information is needed for solution.
- 2.8.8. C – Create and interpret expressions, equations or inequalities that model problem situations.
- 2.8.8. D – Use concrete objects to model algebraic concepts.
- 2.8.8. E – Select and use a strategy to solve an equation or inequality, explain the solution and check the solution for accuracy.
- 2.8.8. J – Show that an equality relationship between two quantities remains the same as long as the same change is made in both quantities; explain how a change in one quantity determines another quantity in a functional relationship.

Curricular Objectives:

Students will:

- A. Perimeter and Circumference
 - a. Name polygons
 - b. Discuss difference between radius and diameter
 - c. Label shapes
 - d. Determine correct formula
 - e. Explain when to convert units
 - f. Find real life examples of perimeter
- B. Area
 - a. Label shapes

- b. Determine correct formula
 - c. Explain “base” and “height”
 - d. Explain when to convert units
 - e. Find real life examples of when to use area
- C. Surface Area and Nets
 - a. Define 3D shape vocabulary
 - b. Determine correct formula
 - c. Find the surface area of rect. Prisms
 - d. Label 2D nets for 3D shapes
 - e. Draw nets for 3D shapes
- D. Volume
 - a. Determine correct formula
 - b. Find the volume of rect. Prisms
 - c. Match situations to type of measurement
- E. Pythagorean Theorem
 - a. Identify parts of a right triangle
 - b. Describe Pythagorean theorem
 - c. Decide when to use the theorem
 - d. Find missing sides of a right triangle
 - e. Solve story problems involving theorem
- F. $D = rt$
 - a. Explain the parts of the formula
 - b. Discuss when to use the formula
 - c. Solve for either distance, rate, or time
- G. Scientific Notation
 - a. Explain the need for scientific notation
 - b. Translate from Scientific Notation to Standard Notation
 - c. Translate from Standard Notation to Scientific Notation
 - d. Check problems using the calculator

Assessments/ Measurement of Objectives:

- Peri, Area, Circ, SA, Vol & Distance quiz
- Peri, Area, Circ, SA, Vol & Distance test
- Class activities/ homework exercises

Suggested Methods of Instruction / Learning Activities:

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| • Active participation in notes | • Large group open-ended practice |
| • Question/answer sessions | • Practice worksheets |
| • Formula sheet overview (locating info) | • Word problems worksheet |
| • Board work | • Standardized test practice |
| • Overhead work | • Calculator practice |
| • Open-ended questions for homework | • Open discussions on real life situations |

Unit 7: Geometry

Estimated Time: 3 weeks

Standard Alignment:

- 2.1.8. A – Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).
- 2.1.8. B – Simplify numerical expressions involving exponents, scientific notation and using order of operations.
- 2.1.8. D – Apply ratio and proportion to mathematical problem situations involving distance, rate, time and similar triangles.
- 2.1.8. G – Use the inverse relationships between addition, subtraction, multiplication, division, exponentiation and root extraction to determine unknown quantities in equations.
- 2.2.8. A – Complete calculations by applying the order of operations.
- 2.2.8. B – Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions.
- 2.3.8. A – Develop formulas and procedures for determining measurements (e.g., area, volume, distance).
- 2.3.8. C – Measure angles in degrees and determine relations of angles.
- 2.8.8. C – Create and interpret expressions, equations or inequalities that model problem situations.
- 2.8.8. D – Use concrete objects to model algebraic concepts.
- 2.8.8. E – Select and use a strategy to solve an equation or inequality, explain the solution and check the solution for accuracy.
- 2.9.8. A – Construct figures incorporating perpendicular and parallel lines, the perpendicular bisector of a line segment and an angle bisector using computer software.
- 2.9.8. B – Draw, label, measure and list the properties of complementary, supplementary and vertical angles.
- 2.9.8. C – Classify familiar polygons as regular or irregular up to a decagon.
- 2.9.8. D – Identify, name, draw and list all properties of squares, cubes, pyramids, parallelograms, quadrilaterals, trapezoids, polygons, rectangles, rhombi, circles, spheres, triangles, prisms and cylinders.
- 2.9.8. E – Construct parallel lines, draw a transversal and measure and compare angles formed (e.g., alternate interior and exterior angles).
- 2.9.8. F – Distinguish between similar and congruent polygons.
- 2.10.8. B – Solve problems requiring indirect measurement for lengths of sides of triangles.

Curricular Objectives:

Students will:

- A. Points, Lines, Planes, Angles
 - a. Define vocabulary related to points, lines, planes and angles
 - b. Label points and lines in a plane
 - c. Name angles 3 different ways
- B. Parallel and Perpendicular Lines
 - a. Explain types of angles
 - b. Find degree measures of angles
 - c. Label special sets of angles
- C. Triangles
 - a. Identify names of special types of triangles
 - b. Find missing sides of triangles
 - c. Apply properties of triangles to find angles
- D. Polygons
 - a. Label polygons
 - b. Differentiate between non-polygon/polygons
 - c. Name polygons by the vertices
 - d. Find the angle sum
 - e. Name polygon by angle sum
- E. Similar Polygons

- a. Know when similar polygons exist
- b. Find missing sides and angles
- c. Set up proportions

Assessments/ Measurement of Objectives:

- Geometry test
- Class activities/ homework exercises

Suggested Methods of Instruction / Learning Activities:

- Active participation in notes
- Question/answer sessions
- Formula sheet overview (locating info)
- Board work
- Overhead work
- Open-ended questions for homework
- Large group open-ended practice
- Practice worksheets
- Word problems worksheets
- Standardized test practice

Unit 8: Percents & Statistics

Estimated Time: 3 – 5 weeks

Standard Alignment:

- 2.1.8. A – Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).
- 2.1.8. B – Simplify numerical expressions involving exponents, scientific notation and using order of operations.
- 2.1.8. D – Apply ratio and proportion to mathematical problem situations involving distance, rate, time and similar triangles.
- 2.1.8. G – Use the inverse relationships between addition, subtraction, multiplication, division, exponentiation and root extraction to determine unknown quantities in equations.
- 2.2.8. A – Complete calculations by applying the order of operations.
- 2.2.8. B – Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions.
- 2.2.8. D – Estimate amount of tips and discounts using ratios, proportions and percents.
- 2.2.8. E – Determine the appropriateness of overestimating or underestimating in computation.
- 2.2.8. F – Identify the difference between exact value and approximation and determine which is appropriate for a given situation.
- 2.3.8. B – Solve rate problems (e.g., rate x time = distance, principal X interest rate = interest).
- 2.4.8. B – Combine numeric relationships to arrive at a conclusion.
- 2.4.8. C – Use if... then statements to construct simple, valid arguments.
- 2.4.8. D – Construct, use and explain algorithmic procedures for computing and estimating with whole numbers, fractions, decimals and integers.
- 2.4.8. E – Distinguish between inductive and deductive reasoning.
- 2.5.8. A – Invent, select, use and justify the appropriate methods, materials and strategies to solve problems.
- 2.5.8. B – Verify and interpret results using precise mathematical language, notation and representations, including numerical tables and equations, simple algebraic equations and formulas, charts, graphs and diagrams.
- 2.5.8. C – Justify strategies and defend approaches used and conclusions reached.
- 2.5.8. D – Determine pertinent information in problem situations and whether any further information is needed for solution.
- 2.6.8. A – Compare and contrast different plots of data using values of mean, median, mode, quartiles and range.
- 2.6.8. B – Explain effects of sampling procedures and missing or incorrect information on reliability.
- 2.6.8. C – Fit a line to scatter plot of two quantities and describe any correlation of the variables.
- 2.6.8. D – Design and carry out a random sampling procedure.
- 2.6.8. E – Analyze and display data in stem-and-leaf and box-and-whisker plots.
- 2.7.8. A – Determine the number of combinations and permutations for an event.
- 2.7.8. B – Present the results of an experiment using visual representations (e.g., tables, charts, graphs).
- 2.7.8. C – Analyze predictions (e.g., election polls).
- 2.7.8. D – Compare and contrast results from observations and mathematical models.
- 2.7.8. E – Make valid inferences, predictions and arguments based on probability.

Curricular Objectives:

Students will:

- A. Finding Percents
 - a. Using calculators to find percents
 - b. Solve story problems
- B. Tax, Tip, Discount, Interest
 - a. Use % in everyday life
 - b. Use $I = prt$ to find simple interest
 - c. Determine if type of percent is good or bad
 - d. Explain connection between all %'s
 - e. Calculate money saved and sale price
- C. Data Analysis
 - a. Use pie charts to answer questions

- b. Use tables and graphs to find percents
- D. Stem and Leaf Plots
 - a. Find mean, median, and mode using plot
 - b. Find range
 - c. Identify components of plot
 - d. Create stem and leaf plots
 - e. Answer wide variety of questions using plot
- E. Box and Whisker Plots
 - a. Explain quartiles and data being $\frac{1}{4}$
 - b. Find range
 - c. Find extremes, median and quartiles
 - d. Answer questions involving plot
 - e. Find inter-quartile range
 - f. Evaluate box-and-whisker based data
- F. Scatter plots
 - a. Explain correlation and line of best fit
 - b. Decide whether a plot is strong or weak
 - c. Find correlation of several scatter plots
 - d. Explain situations and being pos or neg
 - e. Make up correlations using a story
 - f. Determine whether a plot has no correlation
 - g. Draw the line of best fit
- G. Probability
 - a. Calculate odds for coins, spinners & cubes
 - b. Write probability as a fraction or percent
 - c. Find probability of random events
 - d. List coin tosses outcomes
- H. Arrangements and Combinations
 - a. Apply the fundamental counting principle
 - b. Create lists for fundamental counting
 - c. List out combinations
 - d. List out arrangements
 - e. Calculate the total # of sundaes, pizzas, etc.
 - f. Use tree diagrams to show combinations
 - g. Use lines (Ex. __ __ __) for arrangements

Assessments/ Measurement of Objectives:

- Class activities/ homework exercises
- Objective quizzes/ tests
- Problem solving exercises

Suggested Methods of Instruction / Learning Activities:

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| <ul style="list-style-type: none"> • Active participation in discussion • Question/answer sessions • Formula sheet overview (locating info) • Board work • Open-ended questions • Large group open-ended practice • Practice worksheets | <ul style="list-style-type: none"> • Word problems worksheets • Standardized test practice • Flashcard review sessions • PSSA type example questions • Demonstrations of probability events • Discussion on types of graph |
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Unit 9: Real Life Percents & Proportions

Estimated Time: 1 – 2 weeks

Standard Alignment:

- 2.1.8. A – Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).
- 2.1.8. B – Simplify numerical expressions involving exponents, scientific notation and using order of operations.
- 2.1.8. D – Apply ratio and proportion to mathematical problem situations involving distance, rate, time and similar triangles.
- 2.1.8. G – Use the inverse relationships between addition, subtraction, multiplication, division, exponentiation and root extraction to determine unknown quantities in equations.
- 2.2.8. A – Complete calculations by applying the order of operations.
- 2.2.8. B – Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions.
- 2.2.8. D – Estimate amount of tips and discounts using ratios, proportions and percents.
- 2.2.8. E – Determine the appropriateness of overestimating or underestimating in computation.
- 2.2.8. F – Identify the difference between exact value and approximation and determine which is appropriate for a given situation.
- 2.3.8. B – Solve rate problems (e.g., rate x time = distance, principal X interest rate = interest).
- 2.4.8. B – Combine numeric relationships to arrive at a conclusion.
- 2.4.8. C – Use if... then statements to construct simple, valid arguments.
- 2.4.8. D – Construct, use and explain algorithmic procedures for computing and estimating with whole numbers, fractions, decimals and integers.
- 2.4.8. E – Distinguish between inductive and deductive reasoning.
- 2.5.8. A – Invent, select, use and justify the appropriate methods, materials and strategies to solve problems.
- 2.5.8. B – Verify and interpret results using precise mathematical language, notation and representations, including numerical tables and equations, simple algebraic equations and formulas, charts, graphs and diagrams.
- 2.5.8. C – Justify strategies and defend approaches used and conclusions reached.
- 2.5.8. D – Determine pertinent information in problem situations and whether any further information is needed for solution.

Curricular Objectives:

Students will:

- A. Ratios and Proportions
 - a. Testing proportions for equality
 - b. Writing ratios
 - c. Reducing fractions
 - d. Solve ratio and proportion problems using a calculator
 - e. Review cross multiplication
- B. Percent Word Problems
 - a. Solve tax, tip, discount real world problems
 - b. Use percents
 - c. Solve real life situations using %
- C. Using Restaurant Menus
 - a. Order and calculate menu %'s
 - b. Find tip, tax, totals and discount
 - c. Compare menu prices for several items
 - d. Practice making real life choices

Assessments/ Measurement of Objectives:

- Quizzes
- Percent test (all word problems)
- Class activities/ homework exercises

Suggested Methods of Instruction / Learning Activities:

- Index card review game
- Active class participation
- Question and answer session
- Worksheets supplementing lessons
- Restaurant menu practice (real life)
- Word problem worksheet on percents
- Travel project – large group
- Hitching a ride project – large group
- Real life discussions involving percents

Unit 10: Algebraic Equations

Estimated Time: 5 – 8 weeks

Standard Alignment:

- 2.1.8. A – Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).
- 2.1.8. B – Simplify numerical expressions involving exponents, scientific notation and using order of operations.
- 2.1.8. E – Simplify and expand algebraic expressions using exponential forms.
- 2.1.8. G – Use the inverse relationships between addition, subtraction, multiplication, division, exponentiation and root extraction to determine unknown quantities in equations.
- 2.2.8. A – Complete calculations by applying the order of operations.
- 2.2.8. B – Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions.
- 2.5.8. A – Invent, select, use and justify the appropriate methods, materials and strategies to solve problems.
- 2.5.8. B – Verify and interpret results using precise mathematical language, notation and representations, including numerical tables and equations, simple algebraic equations and formulas, charts, graphs and diagrams.
- 2.5.8. C – Justify strategies and defend approaches used and conclusions reached.
- 2.5.8. D – Determine pertinent information in problem situations and whether any further information is needed for solution.
- 2.8.8. C – Create and interpret expressions, equations or inequalities that model problem situations.
- 2.8.8. E – Select and use a strategy to solve an equation or inequality, explain the solution and check the solution for accuracy.

Curricular Objectives:

Students will:

- A. Multi-Step Equations
 - a. Solve one and two step equations
 - b. Solve eqns where you must multiply first
 - c. Simplify equation and then solve
 - d. Check equation solutions
- B. Combining Like Terms Review
 - a. Group together like terms based on variable
 - b. Decide whether terms are like or not
 - c. Simplify expressions
 - d. Solve eqns where combining terms is done
 - e. Decide LCM between numbers
 - f. Solving eqns by multiplying by LCM
- C. Distributive Property Review
 - a. Simplify expressions involving distribution
 - b. Apply PEMDAS to expressions
 - c. Apply distributive property and like terms concepts
- D. Variables on Both Sides of Equation
 - a. Solve eqns by gathering variables on 1 side
 - b. Use distributive property in solving eqns
 - c. Combine like terms with variables on both sides

Assessments/ Measurement of Objectives:

- Solving Equation test
- Combining and distributive property quiz
- Equations test (Final Test)
- Class activities/ homework exercises

Suggested Methods of Instruction / Learning Activities:

- “Multi-Step Equations” worksheet
- Blackboard practice
- Question/answer sessions
- Active class participation
- “Combining Like Terms” practice
- Index card review game
- Large group worksheet sessions